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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/585,482 | 07/10/2006 | Shinji Kajita | 2006_1016A | 7917 |

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| EXAMINER | |
|---|---|
| BLAN, NICOLE R | |

| ART UNIT | PAPER NUMBER |
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| 1792 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/585,482 | KAJITA ET AL. | |
| | Examiner | Art Unit | |
| | NICOLE BLAN | 1792 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *20 May 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *3,9,11,21,22,30,36 and 37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3, 9, 11, 21, 22, 30, 36 and 37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 20, 2009 has been entered.

2. Claims 3, 9, 11, 21, 22, 30, 36 and 37 are currently pending.

### *Response to Arguments*

3. Applicant's arguments, see pages 5-8, filed May 20, 2009, with respect to the rejection(s) of claim(s) 3, 9, 11, 21, 22, 30, 36 and 37 under 35 U.S.C. 103(a) have been fully considered and are persuasive in view of the amendments to the claims. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made. Please refer to the detailed discussion below.

4. Applicant's arguments regarding the limitations drawn to the discharge mechanism have been fully considered but they are not persuasive. This recitation is a statement of intended use which does not patentably distinguish over the prior art of recorded since '075 meets all the structural elements of the claim(s) and is capable of discharging a liquid without supplying liquid to the substrate if so desired. See MPEP 2114. Furthermore, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ@ 528, 531 (CCPA 1959). "[A]pparatus claims cover what a device is,

not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**7. Claims 3 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toshimi et al. (U.S. PGPub 2002/0096196, hereinafter '196) in view of Nguyen (U.S. PGPub 2005/0133075, hereinafter '075).**

Claim 3: '196 teaches a substrate holding mechanism (224, 225a, 225c) which holds the peripheral portion of the substrate (W) attached to a base member (226), wherein the base member faces a back surface of the substrate held by the substrate holding mechanism [see Fig. 33; pages 11-12, paragraphs 135 and 137]. A rotatable shaft (227) attached to the central portion of the base member (226) [see Fig. 33; pages 11-12, paragraph 137]. '196 also teaches that the

apparatus supplies multiple liquids to the bottom surface of the substrate via nozzles 245a, 245b, 245c in Fig. 33 [page 12, paragraph 142]. '196 teaches that there are valves [250a, 250b, 250c, Fig. 33; reads on "switching devices"] for switching between liquids [page 12, paragraph 142]. '196 also teaches that the second nozzle (245c) supplies liquid from a second line because the nozzles are all connected to different liquid supply lines [see Fig. 33 at bottom]. '196 also teaches a nozzle structure that includes the first nozzle and the second nozzle being disposed within said rotatable shaft (227) [see Fig. 33]. '196 teaches that it is known to utilize a switching device for switching between different processing liquids. Therefore, it would have been obvious to an ordinary artisan to use a switching device when supplying two different liquids through a common nozzle.

'196 does not teach that the first and second line have a mechanism for discharging and draining the liquid without supplying the liquid to the substrate. However, '075 shows a generic teaching of a non-dripping nozzle so that droplets do not fall onto a surface [title] and teaches attaching a pump to a line that is connected to the nozzle in order to drain the liquid from the nozzle so that liquid does not fall to the surface of the substrate and damage the substrate [Figs. 4d and 4e; page 1, paragraph 6; page 2, paragraphs 29-30]. Therefore, it would have been obvious to one of ordianry skill in the art at the time the invention was made to incorporate the apparatus of '075 in the apparatus of '475 with a reasonable expectation of success because '075 teaches incorporating a drain in the supply line to prevent liquid that is remaining in the nozzle from falling onto the substrate and damaging it.

Claim 30: '196 and '075 teach the limitations of claim 3 above. '196 also teaches a scatter prevention cup which translates in a vertical direction [(222), Fig. 33; page 12, paragraph 146] to prevent fluid flow from scattering.

**8. Claims 9, 11 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verhaverbeke et al. (U.S. PGPub 2002/0066475, hereinafter '475) in view of Ito (U.S. Patent 6,579,382, hereinafter '382), and further in view of Araki et al. (U.S. Patent 2003/0197841, hereinafter '841).**

Claim 9: '475 teaches a substrate holding mechanism (310) that includes a body having a projection for supporting the substrate (214) [page 2, paragraph 30] and a rotatable pawl having a presser to press the substrate from above (260) [page 2, paragraph 31] which holds the substrate under a force which changes with the change in the rotational speed of the substrate holding mechanism [page 3, paragraph 32]. The rotational speed of the substrate holding mechanism is changed [reads on "increasing or decreasing a rotational speed"] by a motor attached to the chuck (122 and 148) [page 3, paragraph 36] while treatment liquid supply mechanism (122 and 124) supplies cleaning and treatment liquid (DI water) to the substrate [pages 2-3, paragraphs 25, 27 and 36]. '475 additionally teaches that the motor (122) which rotates the substrate holding mechanism relative to a rotation speed of the substrate [page 3, paragraph 36].

'475 teaches a locking mechanism as well as increasing the rotational speed of the substrate holder during a cleaning process to a drying process, but it does teach the acceleration rate that is used to increase the rotational speed of the holder. However, '382 teaches conventional acceleration speeds used in a chemical liquid processing apparatus is 10,000 rpm in

5 seconds or about 2,000 rpm/second for drying [col. 12, lines 24-34]. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to alter the rotational speed of '475 using the conventional acceleration speeds taught by '382 because '382 teaches that acceleration is conventionally known for an increase in a cleaning processing step to a drying processing step.

They do not explicitly teach that an increase in rotational speed at an acceleration such that an inertial force is greater than a static frictional force creates sliding and moving of the substrate relative to the location at which the substrate holding mechanism contacts the substrate. However, '841 teaches that a rapid acceleration and deceleration of a stage cause a substrate to slip on its holder with the force of inertia [page 1, paragraph 19]. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that at least some sliding due to rapid acceleration as taught by '841 will occur in modified '475 because '841 teaches that rapid acceleration produces sliding. Thus, using the conventional and rapid acceleration taught by '382 as the acceleration in '475 would at least produce some slipping as taught by '841.

Claim 11: '475, '382 and '841 teach the limitations of claim 9 above. '475 also teaches changing the rotational speed of the substrate from a first rotational speed (rpm=0 before the cleaning process commences) [pages 2-3, paragraph 31] then changing the rotational speed to a second speed (rpm=3000-6000) [page 3, paragraph 36] and returning to the first rotational speed (rpm=0 for removal of the wafer) [pages 2-3, paragraph 31]. The supply of treatment liquid is

stopped after the rotational speed is increased from the first rotational speed (rpm=0) to the second rotational speed (rpm=300-6000) [page 2, paragraph 27].

Claim 21: ‘475, ‘382 and ‘841 teach the limitations of claim 9 above. ‘475 also teaches that the liquid is supplied to completely coat and clean the substrate [page 3, paragraph 37].

**9. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over ‘475, ‘382 and ‘841 as applied to claim 21 above, and further in view of Yamamoto et al. (U.S. Patent 5,898,720, hereinafter '720).**

Claim 22: ‘475, ‘382 and 841 teach the limitations of claim 21 above. They do not teach or suggest what the film comprises. The examiner takes official notice that copper is a common impurity in layers of semiconductors as evidenced by '720 [col. 6, lines 35-40]. Thus, without evidence of unexpected results, a person of ordinary skill in the art to try the method of processing the semiconductor as taught by modified ‘475 that has the impurities of '720, as a person with ordinary skill has good reason to pursue the known options within his or her technical grasp. In turn, because the processing method for removing impurities is predicted by prior art, it would have been obvious to use the method to process the substrate.

10. **Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over '196 and '075 as applied to claim 3 above, and further in view of Verhaverbeke et al. (U.S. PGPub 2002/0066475, hereinafter '475).**

Claim 36: '196 and '075 teach the limitations of claim 3 above. They do not teach a gas supply nozzle for supplying gas to a space between the substrate and the base member. However, '475 teaches a nozzle for supplying a gas between the substrate and the base member to dry the substrate after processing [page 4, paragraph 39]. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the gas nozzle taught by '475 in the modified apparatus of '075 because '475 teaches using a gas nozzle to dry a bottom surface of a substrate by supplying the gas to a space between the substrate and the substrate and the base.

**11. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over '196 and '075 as applied to claim 3 above, and further in view of Izumi et al. (U.S. PGPub 2003/0196683, hereinafter '683).**

Claim 37: '196 and '075 teach the limitations of claim 3 above. '196 teaches a gas line being placed in a rotatable shaft, but it doesn't teach the gas is supplied between the rotatable shaft and the nozzle structure. However, '683 teaches it is known to supply gas between a rotatable shaft [(14), Fig. 1a] and a nozzle structure [(18), Fig. 1a] in a substrate processing apparatus [page 5, paragraph 81]. Therefore, it would have been obvious to one of ordianry skill in the art at the time the invention was made to incorporate a gas supply between the rotatable

shaft and nozzle of modified '196 as taught by '683 because '683 teaches it is known in the art of processing substrates to incorporate a gas line between the rotatable shaft and the nozzle.

## *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICOLE BLAN whose telephone number is (571)270-1838. The examiner can normally be reached on Monday - Thursday 8-5 and alternating Fridays 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nicole Blan/
Examiner, Art Unit 1792

/Alexander Markoff/
Primary Examiner, Art Unit 1792